

REMARKS

Reconsideration of the application in light of the amendments and following remarks is respectfully requested.

Status of the Claims

Claims 1 - 7 and 9-11 are presently pending, with claim 8 having previously been canceled. Claims 1, 7, 9, 10 and 11 are amended. No new matter is introduced. Support for the amendments may be found, for example, with reference to Applicants' specification at page 9, line 12 through page 11, line 24 and page 12, line 11 through page 15, line 6, and with reference to Applicants' FIGs. 1, 2, 4, 5, 7 and 8.

Examiner Interview

Applicants thank Examiner Garcia for granting an interview on February 15, 2008 to discuss a draft version of this Response. Examiner Garcia's comments significantly influenced revisions to the draft amendments and arguments which are reflected in the present Response

Objections to the Specification

The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. Specifically, the Examiner objects to the term "extends externally from the engagement groove along a longitudinal direction of the shaft joint." Applicants respectfully disagree with the Examiner's objection.

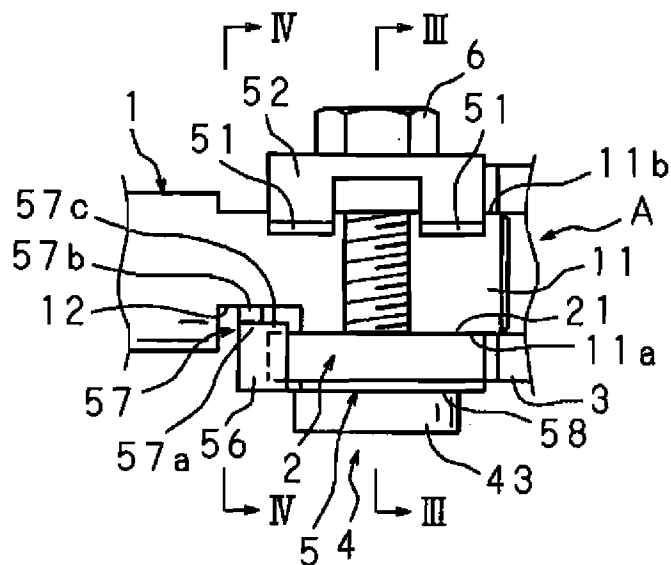
In a Response to final Office Action filed August 9, 2007, Applicants provided the following response to objections to the specification raised in the final Office Action of May 9, 2007:

With reference to FIG. 1, which depicts one example of a coupling structure that is consistent with the principles of the present invention, a flexible member 57 projects in a depth dimension of the engagement groove 21 and extends externally from the engagement groove 21 along a longitudinal direction of the groove (see, e.g., FIG. 2) to engage positioning recess 12 in a manner that regulates movement in the longitudinal direction. A slip-off preventing groove

(semi-circular groove) 11c of the shaft body 1 receives a coupling shaft 6 which is inserted through bores 22, 23 (see, e.g., FIG. 3 and through the slip-off preventing groove 11c.

(Emphasis added)

Applicants refer to FIG. 2, which clearly shows that the flexible member 57 extends externally from the engagement groove 21 in a direction that corresponds to a longitudinal direction of the engagement groove 21:



Applicants submit that sufficient antecedent basis for the objected claim term is provided by Applicants' FIG. 2. The objected term is further supported by the description at page 9, lines 19 - 24 of the specification, which describes:

a flexible member 57 which is connected to the vicinity of one through bore 54 of the curved portion 55 through a bent portion 56, provided on an outer side in the longitudinal direction of the engagement [groove] 21 to engage with the positioning recess 12 of the shaft body 1, and deflectable in the width direction of the engagement groove 21.

(Emphasis added).

With reference to the objected claim term, Applicants submit that the longitudinal direction of the engagement groove 21 (as described in the specification) is congruent with the longitudinal direction of the shaft joint (as recited in the objected claim term). However, in the interests or prosecution efficiency, Applicants amend the objected term to recite “extends externally from the engagement groove along a longitudinal direction of the engagement groove” in order to more precisely correspond to the language of the specification.

Therefore, Applicants respectfully request that the objection to the specification be withdrawn.

Objections to the Claims

Claim 7 is objected to for informalities. Applicants amend claim 7 to make the necessary corrections. Therefore, Applicants respectfully request that the objection to claim 7 be withdrawn.

Rejections Under 35 U.S.C. § 112

Claims 10 and 11 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. Regarding claim 10, the Examiner objects to the term “the portion of the flexible member extending externally from the engagement groove along a longitudinal direction of the shaft joint” as lacking antecedent basis. Applicants amend claim 10 to recited “a portion of the flexible member extending externally from the engagement groove along a longitudinal direction of the engagement groove,” and submit that sufficient antecedent basis is provided as a result of this amendment.

Regarding claim 11, the Examiner finds that the metes and bounds of the claim are unclear. Specifically, the Examiner suggests that as claim 1 claims a coupling structure having the shaft body inserted into an engagement groove, it is unclear how the flexible member operates to prevent such an insertion. Applicants amend claim 11 to depend from claim 10, which is directed to a coupling structure which permits the flexible member to be disengaged from a positioning recess of the shaft body. Amended claim 11 recites:

11. The coupling structure according to Claim 10, wherein the positioning recess of the shaft body and the flexible member are configured such that, when the flexible member has been disengaged from the positioning member and the shaft body has been withdrawn from the engagement groove, the flexible member is released and extends to prevent the shaft body from being reinserted into the engagement groove along the depth direction unless the flexible member is aligned with the positioning recess.

Applicants submit that amended claim 11 is thereby made clear.

Therefore, Applicants respectfully request that the rejections of claims 10 and 11 under 35 U.S.C. § 112, second paragraph, be withdrawn.

Rejections Under 35 U.S.C. § 102

Claims 1-7 and 9-11 are rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 6,474,898 to Aota et al. Claim 9 is rejected under 35 U.S.C. § 102(b) as being anticipated by U.S. Patent No. 5,647,686 to Hancock et al.¹ Applicants amend independent claims 1, 7 and 9 to further clarify the nature of their invention, and respectfully traverse these rejections.

In amended independent claim 1, Applicants claim:

1. A coupling structure, comprising:

a shaft body having a slip-off preventing groove and a positioning recess close to an end portion thereof;

a shaft joint having an engagement groove with which the shaft body is engaged, bores facing the engagement groove, and

a flexible member which projects in the depth direction of the engagement groove, extends externally from the engagement groove along a longitudinal direction of the engagement groove, and engages an engagement face in the positioning recess such that the flexible member regulates movement of the shaft body in the longitudinal direction of the engagement groove; and

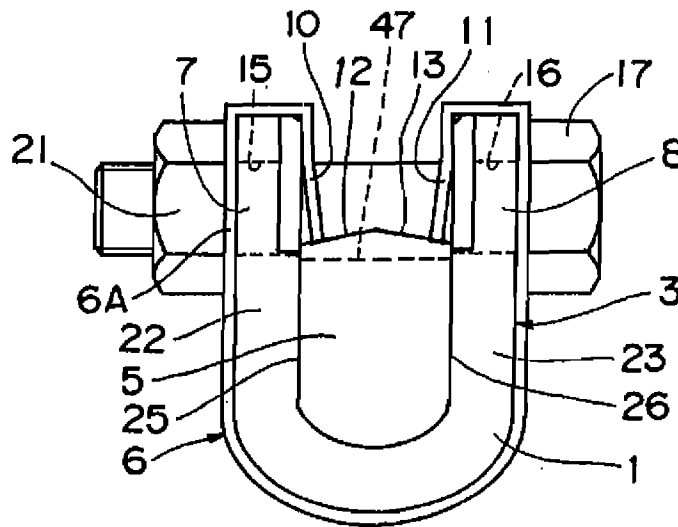
a coupling shaft, which is inserted into the bores and the slip-off preventing groove, for coupling the shaft body and the shaft joint;

wherein the flexible member is configured to be deflected in a width direction of the engagement groove for engaging the engagement face.

¹ While the Office Action cites Aota as the reference under which claim 9 is additionally rejected, Applicants submit that the Examiner's arguments indicate that this rejection is made in view of Hancock.

(Emphasis added)

Aota discloses a coupling structure having a shaft body 5, a shaft joint 1 and flexible members 10, 11 for respectively engaging upper taper surfaces 12, 13 to regulate a vertical positioning of the shaft body 5 within an engagement groove of the shaft joint 1 (see, e.g., FIG. 3 of Aota, as reproduced below).



In comparison to Applicants' coupling structure as claimed in amended independent claim 1, Aota's flexible members 10, 11 are not engaged with a positioning recess, but rather with taper surfaces 12, 13, which extend upwardly with no apparent concavity to define a top surface of the shaft body 5.² No recesses are required in taper surfaces 12, 13, as flexible members 10, 11 extend over taper surfaces 12, 13 rather than within a recess to restrict vertical movement of the shaft body 5 within shaft joint 1. Unlike Applicant's claimed coupling structure, Aota's flexible members 10, 11 are not configured to regulate movement of the shaft body 5 in a longitudinal direction of the engagement groove. In addition, Aota's flexible members 10, 11 are fully contained within the engagement groove of the shaft joint 1, and do not extend externally from the engagement groove along a longitudinal direction of the engagement groove.

² In this context, the term "recess" connotes "[an] indentation or small hollow." See, e.g., <http://www.thefreedictionary.com/recess>.

For at least the above-argued reasons, Applicants submit that amended independent claim 1 is not anticipated by Aota. As independent claims 7 and 9 have been amended to essentially include the above-argued as distinguishing amended independent claim 1 over Aota, Applicants further submit that amended claims 7 and 9 are not anticipated by Aota.

In amended independent claim 9, Applicants claim:

9. A coupling structure, comprising:

a shaft body including:

an engagement portion, and

a positioning recess close to an end portion of said shaft body and adjacent the engagement portion;

a shaft joint including:

an engagement groove with which the shaft body is engaged,

bores facing the engagement groove, and

a flexible member which projects in a depth direction of the engagement groove, extends externally from the engagement groove along a longitudinal direction of the shaft joint, and engages an engagement face in the positioning recess to regulate movement of the shaft body in the longitudinal direction of the engagement groove; and

a coupling shaft, which is inserted into the bores, for coupling the shaft body and the shaft joint,

wherein the flexible member is configured to be deflected in a width direction of the engagement groove for engaging the engagement face.

(Emphasis added).

Hancock discloses a shaft coupling including a shaft body 1, a shaft joint 3, a flexible member 9 within the shaft joint 3), and a coupling shaft 4 (see, e.g., FIG. 6 of Hancock, as reproduced below).

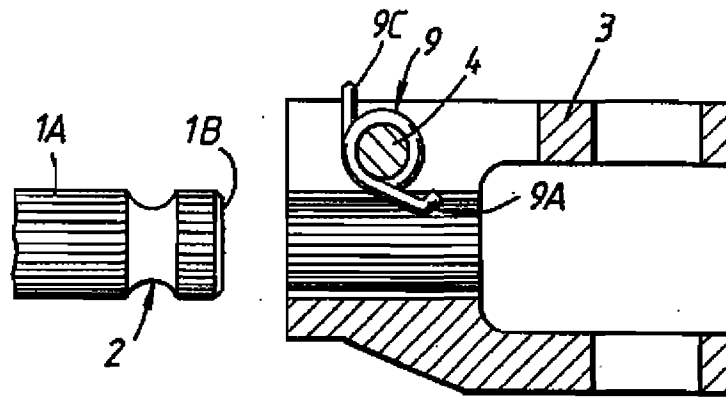


Fig.6

In sharp contrast to Applicants' invention as claimed in amended independent claim 9, Hancock's flexible member 9 does not extend externally from an engagement groove along a longitudinal direction of the shaft joint 3, but is rather confined internally within the shaft joint 3 along its longitudinal direction. Moreover, unlike Applicants' claimed structure, Hancock's flexible member 9 is not configured to be deflected in a width direction of the shaft joint for engaging an engagement face. Rather, flexible member 9 deflects along the longitudinal direction of the shaft joint 3

For at least the above-argued reasons, Applicants submit that amended independent claim 9 is not anticipated by Hancock. As none of independent claims 1, 7 and 9 are anticipated by the cited references, Applicants respectfully submit that independent claims 1, 7 and 9 stand in condition for allowance. As claims 2 - 6, 10 and 11 each depend either directly or indirectly from allowable independent claim 1, Applicants further submit that dependent claims 2 - 6, 10 and 11 are also allowable for at least this reason.

Therefore, Applicants respectfully request that the rejection of claims 1-7 and 9-11 under 35 U.S.C. § 102(b) be withdrawn.

CONCLUSION

Each and every point raised in the Office Action, dated October 26, 2007 has been addressed on the basis of the above amendments and remarks. In view of the foregoing it is believed that pending claims 1-7 and 9- 11 are in condition for allowance and it is respectfully requested that the pending claims be allowed and the case passed to issue.

If there are any other issues remaining which the Examiner believes could be resolved through a Supplemental Response or an Examiner's Amendment, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated below.

Dated: February 25, 2008

Respectfully submitted,

By 

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